Ground-based Activities

SSAC Workshop III

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Outline

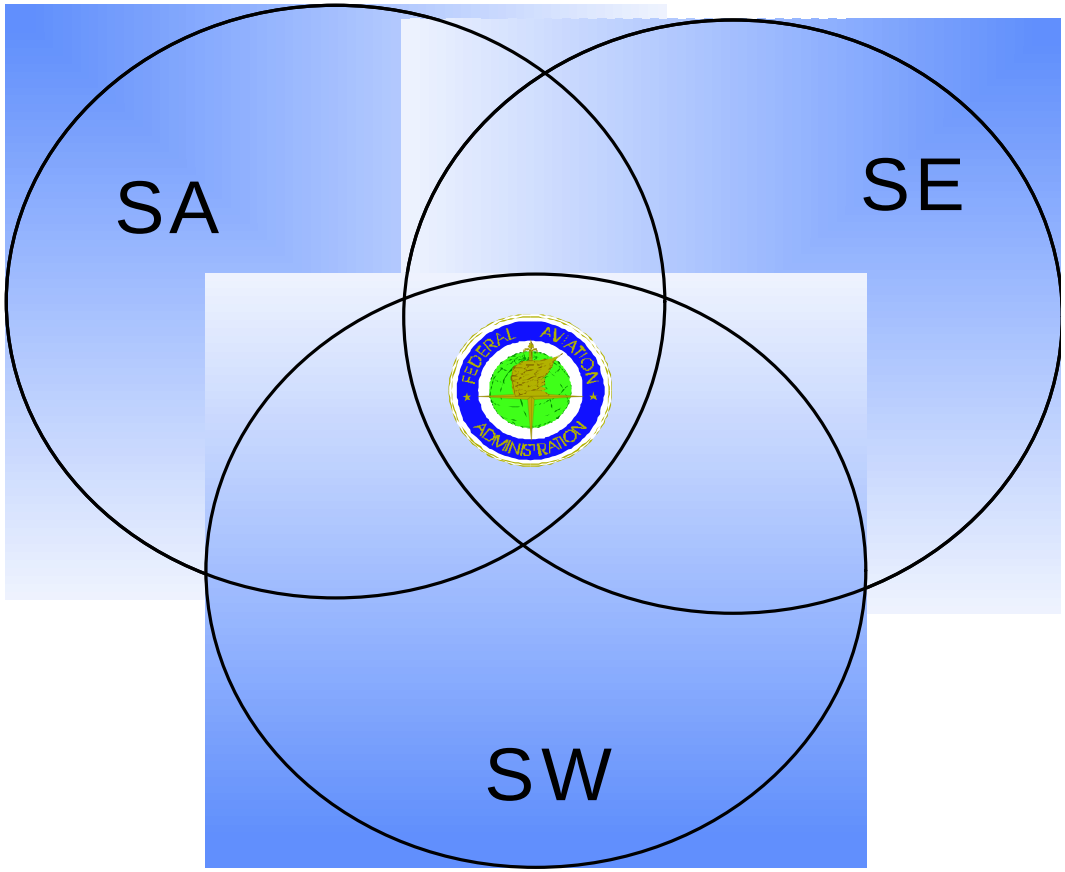
- Federal Aviation Administration - integrated Capability Maturity Model (FAA-iCMM®)
- Communications, Navigation, Surveillance / Air Traffic Management (CNS/ATM) Guidelines
- Software Competency Initiative
- DO-178B training
- Future Plans

FAA-iCMM®

Www.faa.gov/ait/sepg/

System/Software Acquisition Model

Systems Engineering Model



Software Engineering Model

Purpose

- Tool to measure your existing processes
- Framework for improving the processes

FAA-iCMM® Architecture

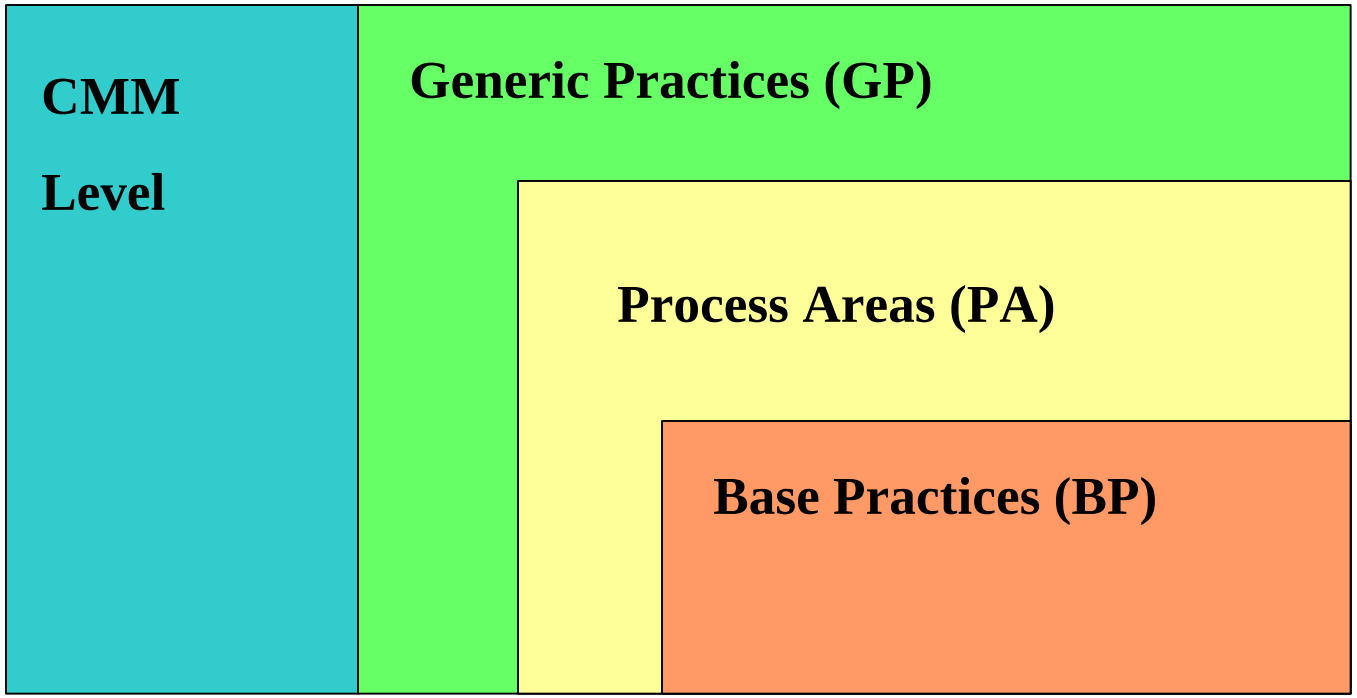
What must be done?

Process areas

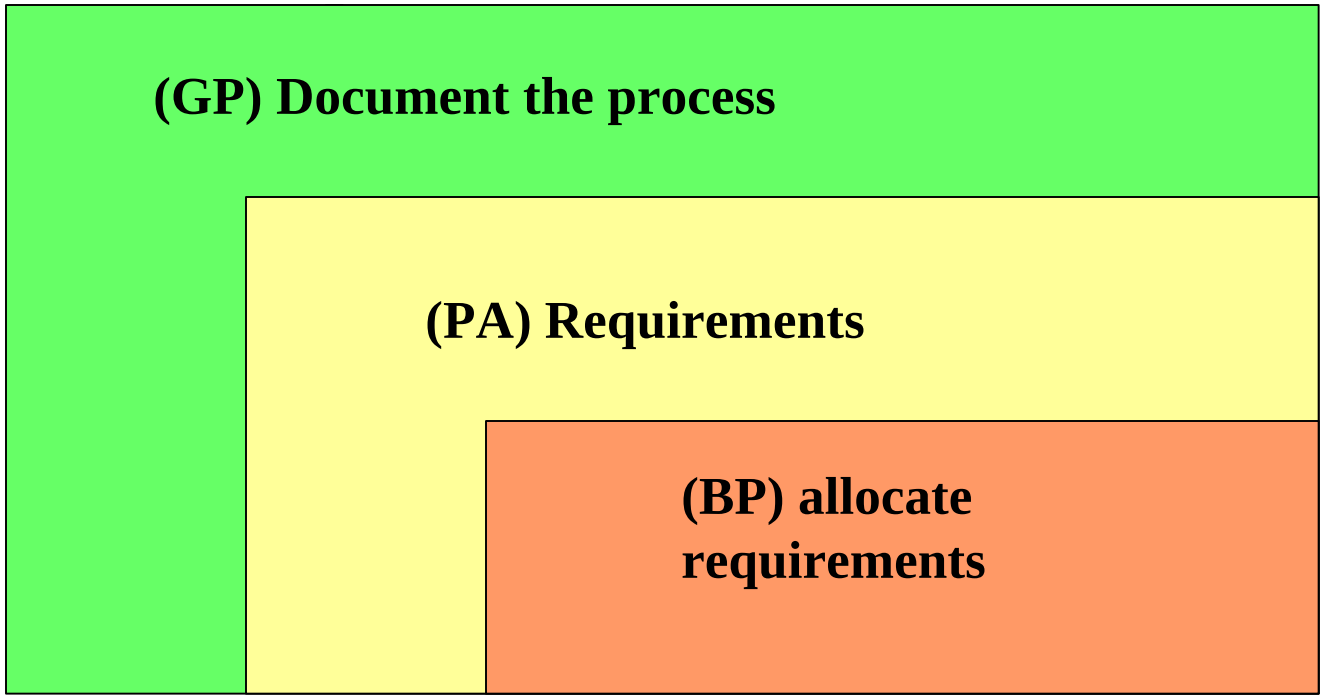
Base practices

How well are you doing it?

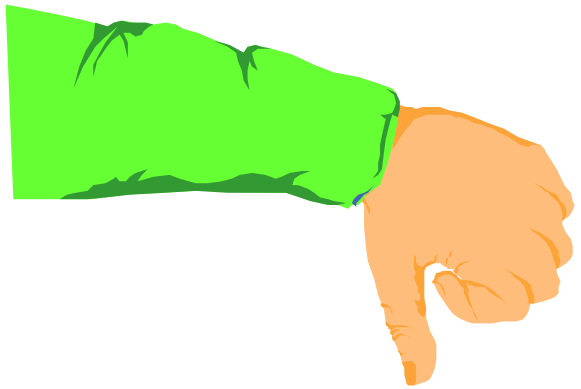
Generic practices



Capability Example



Common Misconceptions



- CMM’s define the process
- CMM’s are handbooks or training guides
- CMM’s replace product evaluations
- Too much documentation is required

Future of FAA-iCMM®

- Goal of acquisitions programs to meet Level 2 by end of FY99.
- Formal appraisal methods
- Security aspects
- Safety aspects

CNS/ATM Guidelines

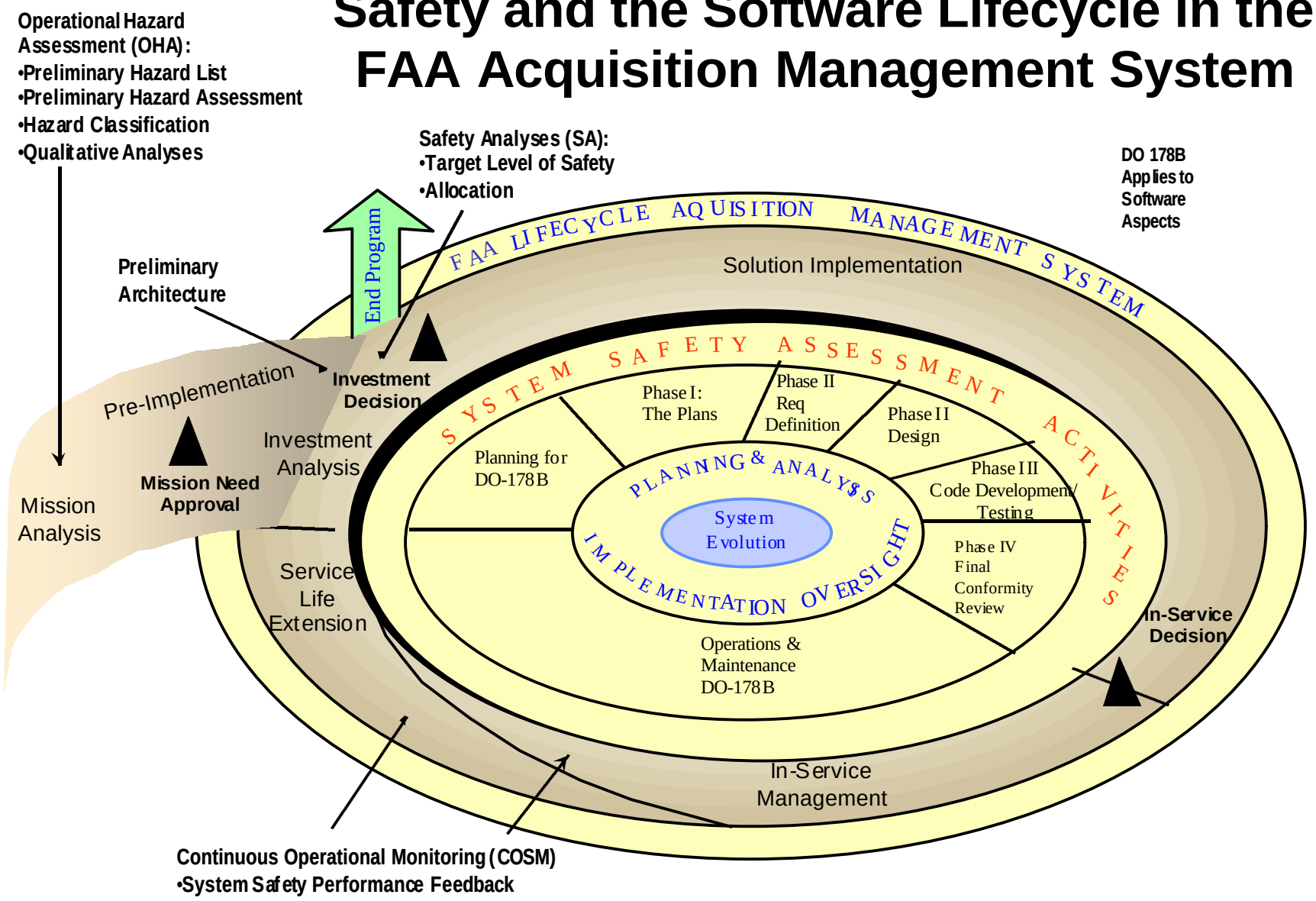
Purpose

- Provide guidance to ensure consistency as well as an acceptable level of confidence in the development of the software components of the NAS
  - Does the software perform its intended function?
  - Is the software safe?
  - Is the software maintainable?

Themes

- Lessons learned vs perscriptive
- “Design for maintenance” philosophy
- Use of Designees to complement the workforce
- Tied to AMS and DO-178B

Safety and the Software Lifecycle in the FAA Acquisition Management System



Content

- System Safety Assessment Process
  - RTCA/SC-189
- Application of DO-178B
  - Phases of AMS
    - Assurance activities
    - Tools
- Maintenance
  - Change impact analysis
  - Legacy systems
  - Service history

Future plans

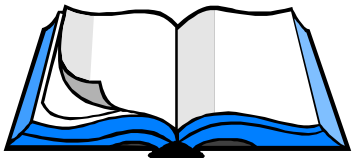
- Prototype (CPDLC, Build 1A)
- Update based on lessons learned
- Mapping of FAA-iCMM
- Training “How to apply” guidelines

Software Competency

Three Dimensions Describe Competency

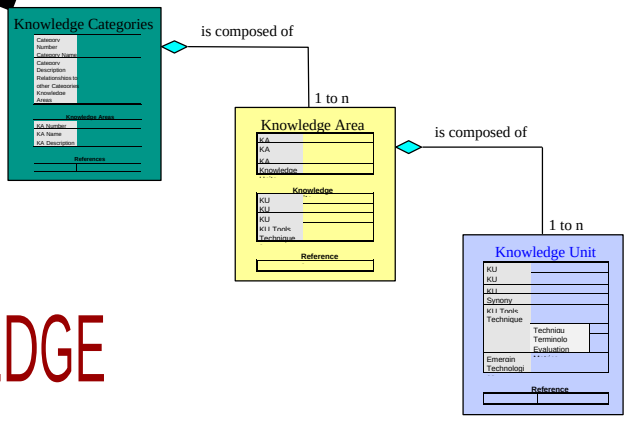
PROCESSES

FAA Integrated CMM (FAA-iCMM®)



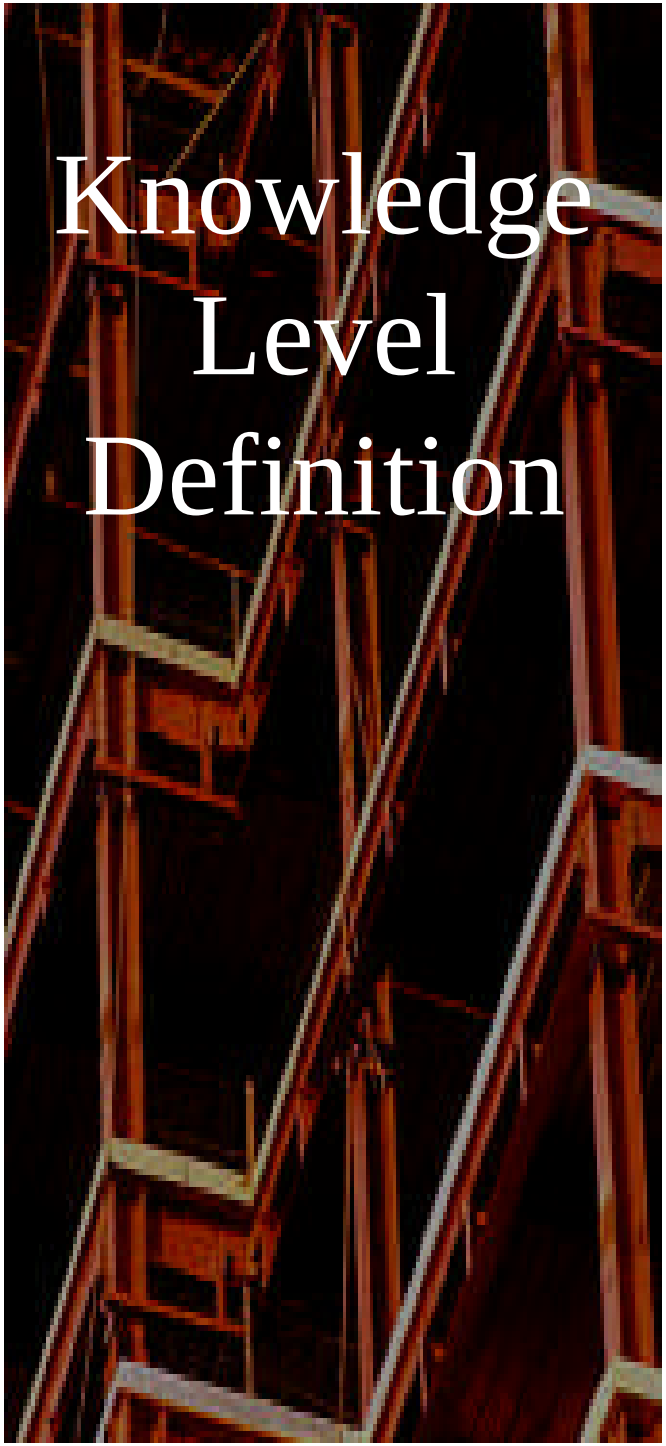
Workforce Learning System

Software Engineering Body Of Knowledge

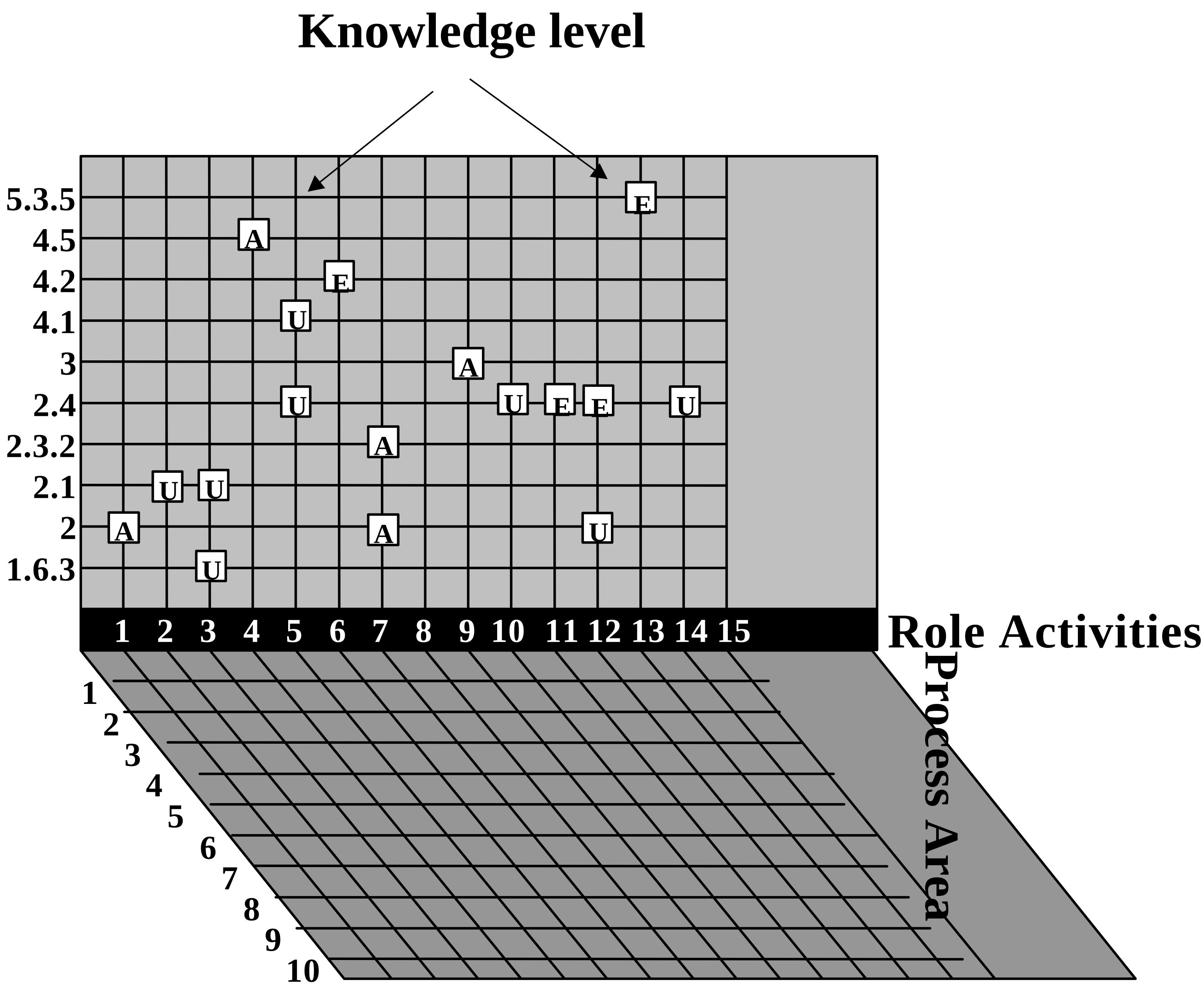


PEOPLE (ROLES)

KNOWLEDGE



- **Awareness**
  - **awareness of the existence and context of the subject**
  - **provide a general, informal explanation**
  - **identify references that provide greater depth of knowledge**
- **Understanding**
  - **explain the subject through definition and example**
  - **appreciates the effort needed to perform work**
  - **monitor progress of work**
  - **evaluate quality of work**
- **Execution**
  - **produce products**
  - **analyze and evaluate methods and techniques**
  - **inform others about content and practices**


Knowledge level
5.3.5
4.5
4.2
4.1
3
2.4
2.3.2
2.1
2
1.6.3
A
E
U
A
U
E
U
A
E
E
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A
U
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A
U
A
U
U
E
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Role Activities
Process Area
1
2
3
4
5
6
7
8
9
10

Future Plans

- Development of a curriculum

DO-178B training

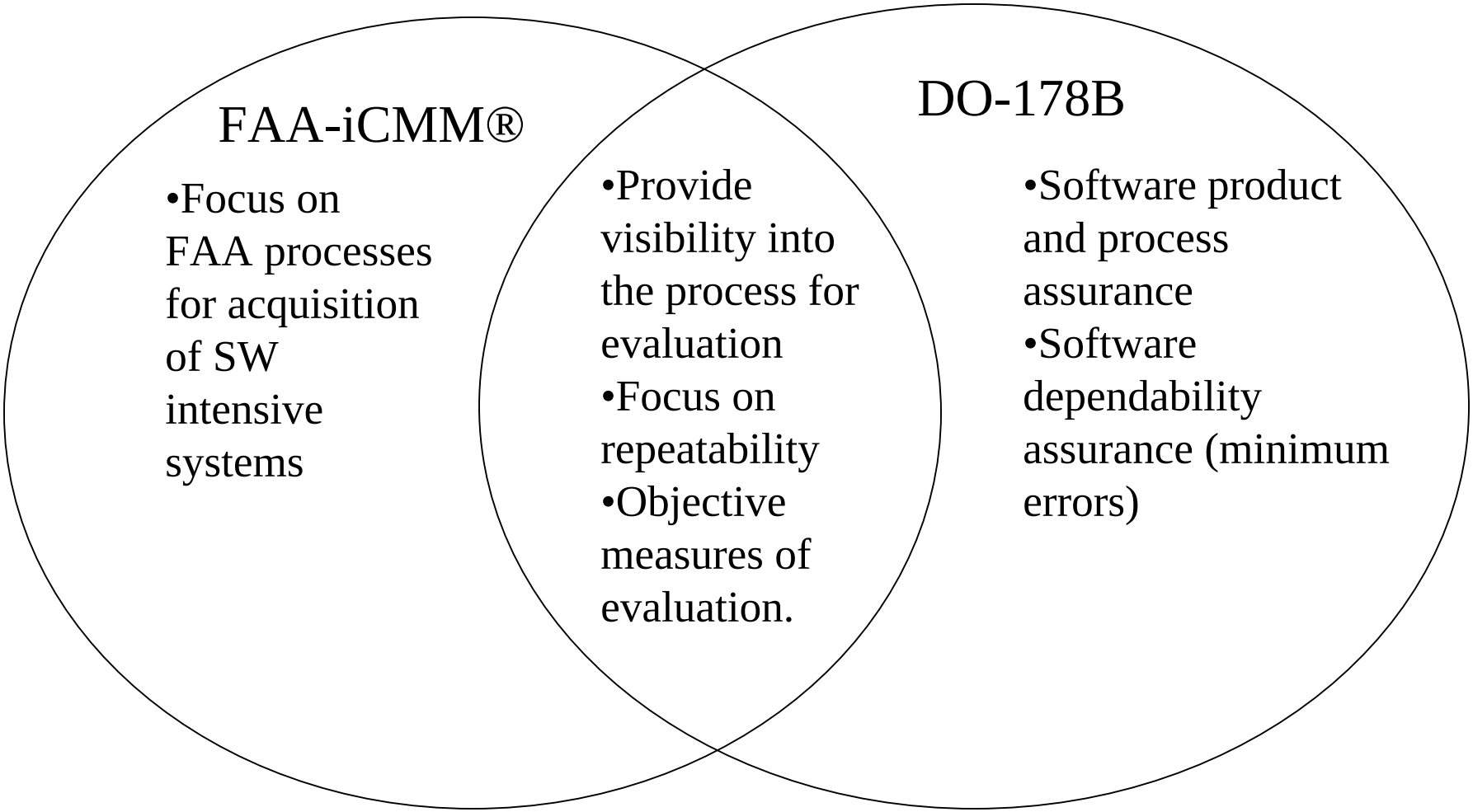
Purpose

- To provide information needed to make informed decisions regarding DO-178B.
- To show benefits of using DO-178B.
- To provide thoughts on how to succeed at using DO-178B in the acquisition environment.

Issues of acquiring SW intensive systems

- Air traffic is growing and current systems are limited. FAA needs will soon outgrow the current systems
- Funding is limited
- Maintenance is expensive
- The complexity of SW systems is increasing
- FAA needs to accelerate deployment of new systems in a faster way, providing same or higher quality and safety
- Acquisition managers need to address safety risks

DO-178B and the FAA i-CMM®

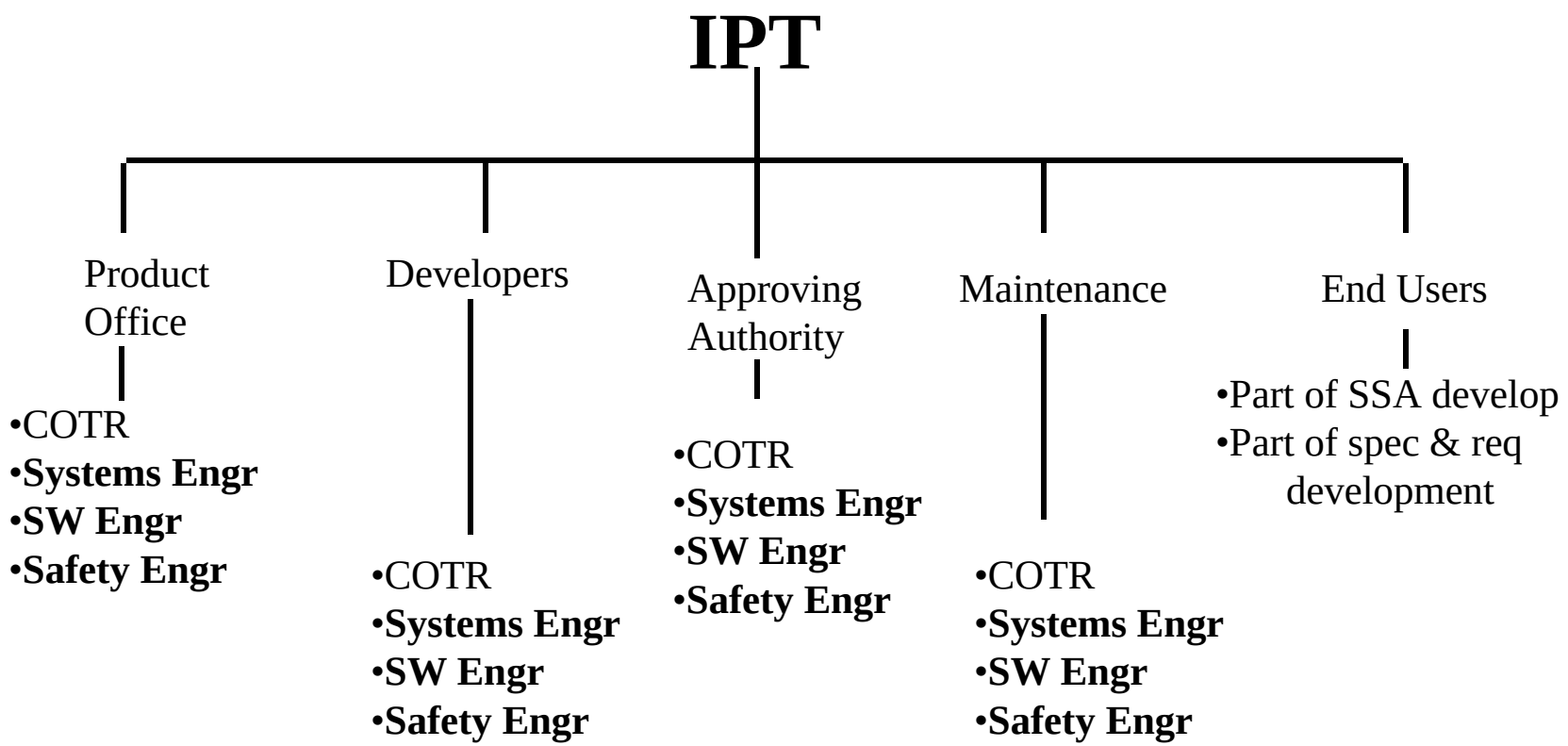


Why use DO-178B

- Benefits of using DO-178B over other processes
  - Cost
  - Schedule
  - Planning
  - Verification

How To Succeed Using DO-178B

TEAM FOR SUCCESS



How to Succeed Using DO-178B

- Assess system/software safety and assurance needs during Mission Needs Analysis and Investment Analysis
- Understand what you want to build and safety impacts from a global perspective including interfaces and costs of maintenance
- Use architectural alternatives to reduce required levels of software assurance.

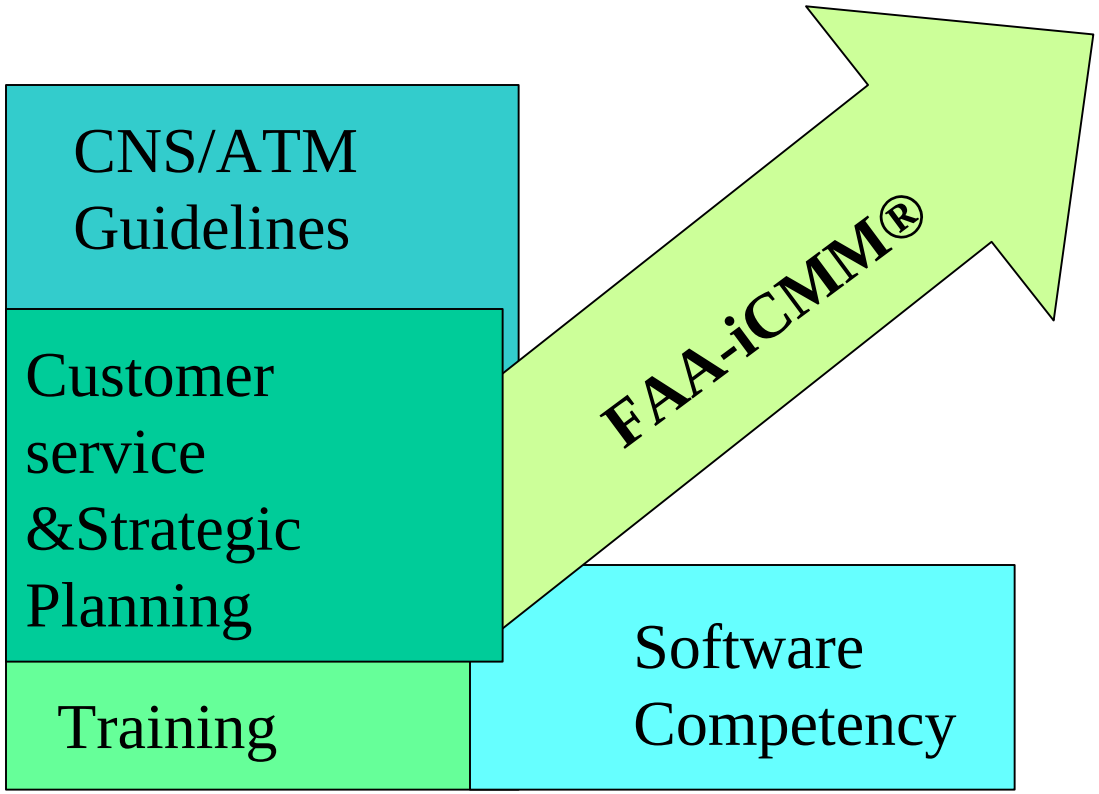
How to Succeed Using DO-178B - Cont

- Provide clear description of what should be included in the RFP related to DO-178B application and expertise (identifies serious bidders)
- Assess potential contractors in systems, safety assessment, and software (DO-178B) capabilities prior to contract award
- Explore the possibility of using Designated Engineering Representative (DER) equivalents based on the air community successes

AIO Strategy of Software Engineering

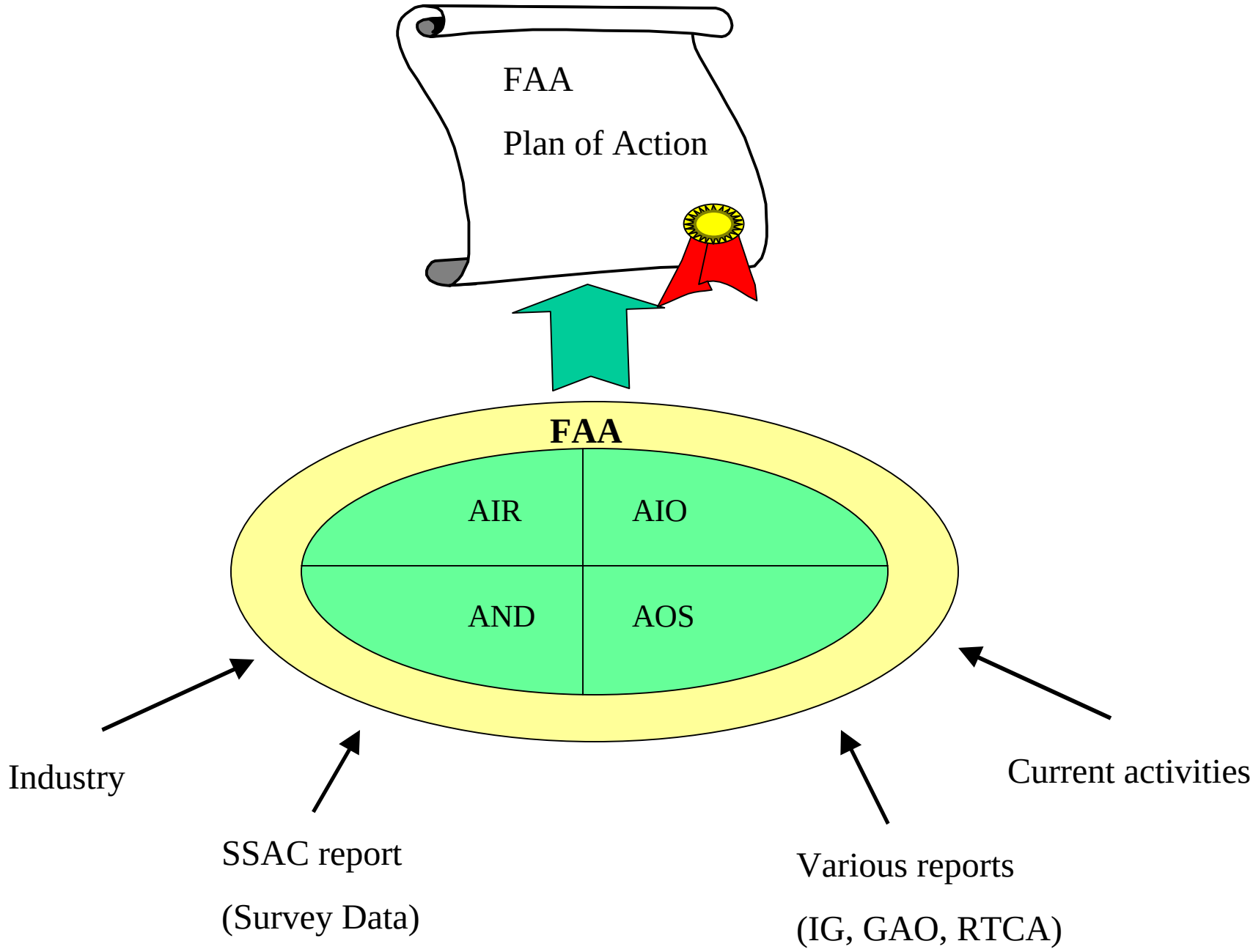
•Continuously improve software and systems engineering processes

•Selectively support software engineering research



•Continuously support improvement in FAA workforce skills

Future Plans


FAA
Plan of Action
FAA
AIR
AIO
AND
AOS
Industry
SSAC report
(Survey Data)
Various reports
(IG, GAO, RTCA)
Current activities